

Climatological Data for November, 1909.
DISTRICT No. 11, CALIFORNIA.

Prof. ALEXANDER G. McADIE, District Editor.

GENERAL SUMMARY.

November, 1909, was the rainiest November for five years in California, also the coldest November, considering the State as a whole, since the present method of determining State averages has been in use. Rain fell on 12 days as a general average, though in some portions of the State the number of rainy days reached 21. The rain was well distributed geographically and also in frequency and intensity. Comparing the present November with past months of the same name for 60 years, it appears that 32 of these Novembers were of a different character, being drier and presumably warmer. Our temperature records are not as complete as the rainfall records. On the other hand, there are 13 well marked wet Novembers in which the rainfall far exceeded that of the present year. It is an interesting fact that there has been no excessively wet November for the past 24 years.

Some of the noteworthy features of the weather during the month were as follows: Unusually warm weather prevailed in southern California on the 2d and 3d. At Los Angeles temperatures of 92° and 94° occurred and at San Diego 80° and 86°. On the 9th the first rain exceeding 0.02 inch in amount since March 27 fell at San Diego. This was the longest period without rain of consequence in the history of the station. On November 12 frost warnings were issued for the northern counties of California and for the southern counties back from the coast. The forecasts were handsomely verified, but the particular point of interest is that this was unusually early in the season for such low temperatures. Again on November 15 and 16 heavy frosts occurred. On November 18 there was a rapid rise in temperature in southern California and in southern Nevada, probably due to foehn wind conditions. It is interesting to note that at the same time chinook conditions prevailed in other portions of the Pacific slope. On November 22 in the Salinas Valley the heaviest earthquake shock since April 18, 1906, occurred. The snowfall in the mountain sections was both early and heavy. At the close of the month there were 4 inches on the ground at Summit, 5 inches at Fordyce Dam, and 22 inches at Tamarack. The warm rains removed much of the November snowfall. There was rather more fog than usual along the coast and less tule fog in the valleys. The winds alternated between brisk to high southeast and moderate northeast. No especially high velocities were reported.

TEMPERATURE.

The monthly mean temperature for the State was 50.7°, which is 1.3° below the normal. The highest monthly mean was 61.8° at Indio. The lowest monthly mean was 29.2° at Tamarack. The highest temperature was 100° at Escondido on the 2d, and the lowest was -8° at Tamarack on the 15th. The greatest daily range was 69° at Escondido on the 3d.

PRECIPITATION.

The average precipitation for the State was 4.52 inches, or 0.98 inch above the normal. The greatest monthly amount was 39.73 inches at Monumental and the least zero at Bagdad. The greatest 24-hour rainfall was 9.60 inches at Monumental on the 22d. The greatest snowfall was 116 inches at Tamarack and the next 61 inches at Fordyce Dam. The report from Summit for November has not yet been received.

THE PROBLEM OF THE SACRAMENTO.

The most important question connected with hydraulic engineering in California is that of the reclamation of the swamp and overflowed land in the Great Valley of California. The problem has been before the people of the State in one form or

another since the great flood of 1868, due to the abnormally heavy rainfall of December, 1867 (12.85) inches, and of January, 1868 (6.04 inches). Each recurring flood has called the attention of the press and the public to the need of general concerted action, both to protect the large interests now jeopardized and also to conserve for future use the large volume of water wasted in these destructive run-offs. Many exhaustive reports have been presented and numerous efforts have been made by public bodies to obtain both State and Federal aid for the betterment of existing conditions. One of the most valuable contributions to the subject has been the general discussion of the problem as undertaken by the Commonwealth Club of San Francisco, an organization of about 1,000 professional and business men. The general discussion has now extended over a period of nearly six years. Perhaps the best synopsis of the whole matter is contained in a report by Mr. Edwin F. Adams, published in September, 1909. The substance of this report was presented in May, 1904, and was the first formal presentation of the subject in available form for students and engineers. The floods of March and April, 1904, an account of which can be found in the Monthly Climatological Summary, California Section, of those dates, enabled Mr. Adams to secure the active assistance of many engineers and property owners interested in the subject. It will convey some idea of the scope of Mr. Adams's work to say that he refers to the 90 or more statutes of the legislature relative to swamp and overflowed lands and 54 sections of the code, has read all the official and other reports, studied all maps available, and has personally visited at times of low water and high water the overflowed section. The following extract from the paper shows the area of the swamp land involved:

As a result of the Federal Act of 1850 there was granted to the State of California from one and three-quarters to two million acres of swamp land, or from 2,300 to 3,100 square miles (Marsden Manson, Vol. 5, Transactions of the Technical Society of the Pacific, 1888, page 85). Of these only those in the Sacramento and lower San Joaquin valleys lying about Collinsville in Solano County, and New York Landing in Contra Costa County, are factors in what may be called the problem of the Sacramento. They embrace the islands in the Sacramento and San Joaquin, the adjacent swamp lands, and the lands of the five "Basins." As this paper will not in anyway deal with questions of engineering, it may perhaps be stated here for the benefit of those not familiar with the subject that the Sacramento River never did and probably never can be made able to carry within its natural bed the waters poured into it in seasons of normal and greater than normal rainfall. Like other sediment-carrying streams flowing through the lowlands, the river by ages of overflow built up along its banks above the delta a strip of land higher than the land farther away from the stream, but at certain points, determined by natural causes, there were and are depressions in these banks through which the floods pour into the lowlands beyond, remaining there until, by slow drainage as the high waters recede and permit it, they find their way back into the river at a lower point. The depressions in which these overflow waters lie during a great part of the summer are known as "basins," including the Yolo, or Yolo-Solano, Basin (mean elevation above low water in Suisun Bay, 12 feet); American Basin (mean elevation, 20 feet); Sutter Basin (mean elevation, 22 feet); Colusa Basin (mean elevation, 35 feet); Butte Basin (mean elevation, 65 feet). Elevations estimated by Grunsky, quoted by Manson. (Transactions Technical Society, Vol. V, page 88.). Some of this land is too low to admit of complete drainage by gravity. It could only be accomplished by levees and pumping. In addition to these basin lands there are the islands of the San Joaquin and Sacramento delta, and the lands subject to overflow along the lower San Joaquin and its tributary. The total amount of land within the area considered in this paper, subject to assessment for reclamation purposes, and from which the revenue should come wherewith to pay the cost of reclamation and maintenance thereafter, is estimated as approximately 750,000 acres.

Mr. A. L. Shinn, of Sacramento, after careful examination of the quantity of land that will be benefited by reclamation on the Sacramento and San Joaquin rivers, finds that the area will approximate 1,000,000 acres.